ABSTRACT OF THE DISCLOSURE

A generator system in accordance with the invention has two modes of operation, such as 120 VAC and 240/120 VAC modes of operation. The generator system has a permanent magnet generator with two independent sets of windings that each generate a three phase AC voltage. One three phase AC voltage is coupled to a first or master cycloconverter and the second three phase AC voltage is coupled to a second or slave cycloconverter. Live outputs of each cycloconverter are coupled to each other through a switch, such as a relay and neutral outputs of each cycloconverter are coupled to ground. A controller controls the cycloconverters to provide a first voltage, illustratively 120 VAC, across their respective outputs having the same amplitude. When in the 120 VAC mode, the switch across the live outputs of the first and second cycloconverters is closed, shorting the live outputs of the first and second cycloconverters together and the controller operates the first and second cycloconverters so their output voltages are in phase with each other. When in the 240/120 VAC mode, the switch across the live outputs of the first and second cycloconverters is open and the controller operates the first and second cycloconverters so that their output voltages are 180 degrees out of phase. The permanent magnet generator has rotor position sensors that are used by a brushless DC motor drive to drive the permanent magnet generator as a brushless DC motor to start the engine of the generator system and also to develop cosine wave information for use in controlling the cycloconverters.